Installation and Operation Manual

AI-LCD68-01-xx

6.8" LCD Monitor w/Arm

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AI-LCD68-01-xx

6.8" LCD Monitor Plug In

1.0 General Information

1.1 Introduction

This manual contains information for the proper installation of the Audio International, Inc. (AI) 6.8" LCD Monitor with Arm Assembly, Model No: AI-LCD68-01-xx. The “-xx” suffix in the model number designates the type of connector utilized by the plug-in arm; “-02” utilizes the Cannon MS3126F12-10P connector and “-13” utilizes the MDM-9SH003B micro D-Sub 9-pin connector. Also included are physical and electrical characteristics of the unit.

1.2 Purpose of the Equipment

Audio International’s AI-LCD68-01-xx is a compact, lightweight LCD monitor specially designed for use with AI 202000xx plug-in arm assembly in a corporate aircraft environment. The monitor's unique display and control electronics architecture allow a compact size while still maintaining robust mechanical strength and reliability.

To ensure excellent display quality, the AI-LCD68-01-xx monitor combines high resolution and the latest TFT technology, which provides brilliant and accurate color reproduction, excellent high contrast images, cross talk suppression, and fast response time with no distortion or smearing.

AI-LCD68-01-xx connects to a versatile plug-in arm with three (3) axis points designed to provide the user with maximum viewing options (see Section 4.0) while maintaining low weight.

1.3 Operational Features

- DO-160 tested
- 16 million, 24-bit colors
- Excellent viewing angle
- NTSC video format
- Operates directly from +28 VDC with low power consumption
- Compact, lightweight package
- Solid state circuitry
- Ultra thin construction
- NTSC video input

- Utilizes a versatile arm mount to give user maximum viewing options
- Easy to mount and connect

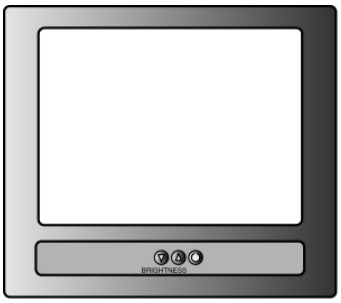
1.4 Optional Equipment

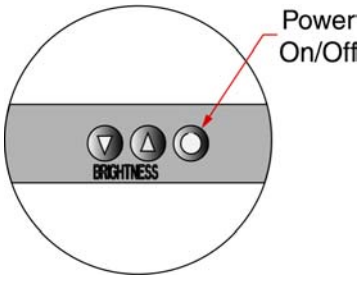
Audio International, Inc. offers a comprehensive family of source equipment and cabin speaker systems. These modules can provide excellent additions for any cabin environment. Audio International furnishes equipment suited for any desired in-flight entertainment system.

Contact your AI representative for details.

2.0 Application

2.1 The monitor possesses three (3) buttons mounted on the lower face; far right-most button (Power On/Off), Center Button (Brightness Up), and far left-most button (Brightness Down).





Brightness Up and Brightness Down controls allow the user the ability to increment or decrement through 16 levels of brightness, from 5 to 250 NIT range.

2.2 Typical interfaces include various types of video source equipment. This unit is capable of interfacing and accepting NTSC video input from all standard COTS (Commercial-Off-The-Shelf) video source equipment including but not limited to: Camcorder, Live-Feed Camera, DVD, VCP and VCR players as well as Moving Map Systems utilizing NTSC, and Personal Game Systems.

3.0 Installation

3.1 Prior to Installation

During the design and layout of the aircraft cabin, careful consideration of the location of this module is necessary. Some of the items to be considered include:

3.1.1 The AI-LCD68-01-xx shall be installed to conform to the standards designated by the customer, installing agency, and existing conditions as to the unit location and type of installation.

3.1.2 Locate the monitor as close as possible to source equipment to reduce the possibility of noise introduced into the video.

3.1.3 The –02 version's base unit is furnished with MS connector and hardware to mount connector to base while the –13 version is furnished with a D-Sub connector. Install mating connector keyway facing the same direction as the swivel arm keyway to insure proper alignment.

3.2 Unpacking and Inspection

3.2.1 Carefully open the packaging and remove the AI-LCD68-01-xx. Verify that all components have been included in the package per the packing list. Inspect the unit for damage. Retain the packing materials and packing list.

3.2.2 If damage has occurred during shipping, a claim should be filed with Audio International WITHIN 24 hours and a **Return Request Authorization Number** shall be obtained from AI by contacting the Repair Department at 501.801.0640. Repackage the unit in its original packaging materials and return it to AI following instructions given by the AI representative. Refer to the front cover of this manual for address. If no return is necessary, retain the packing list and the packing materials for storage.

3.3 *Cautions and Warnings*

3.3.1 It is important to do a pin-to-pin power and ground check on all connectors. Audio International recommends using an Electrical Meter set to read Ohms or an Audible Continuity Tester to confirm that the pins are connected via wiring. Ensure that power and ground are applied only where specified. Damage to the unit may result if power or ground is applied to the wrong points.

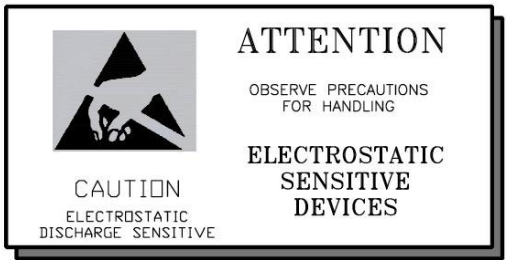
3.3.2 **DO NOT** connect or disconnect the monitor while power is applied.

3.3.3 **DO NOT** remove any factory-installed screws. Damage to the units may result and void any warranties.

3.3.4 **DO NOT** expose to moisture.

3.3.5 Maintain an operating temperature of -15° to +55° C (+5° to +131° F). Storage temperature must remain between -20° to 70° C (-4° to 158° F)

3.3.6 **ESD** (Electro Static Discharge) guidelines shall be followed.



3.4 Wiring Requirements

3.4.1 Introduction

The installing agency shall supply and fabricate all external cables and mating connectors. The length and routing of external cables should be carefully studied and planned before attempting installation of the equipment in order to help avoid potential noise sources and ground loops. Length and routing of external cables should be considered to avoid possible noise sources and ground loops. Maintain a minimum clearance of three (3) inches from any control cable. If wiring is run parallel to combustible fluid or oxygen lines, maintain a separation of six (6) inches between the lines.

3.4.2 Power Wires

Audio International recommends that power and ground wires be 20 AWG minimum. The chassis shall be electrically bonded to the airframe structure by a conductive mounting point with <0.1 Ω resistance using <50 Ω impedance cable. Aluminum wool, nylon webbing impregnated with aluminum oxide abrasive or fiber bristle brushes are the approved tools for removing anodized surfaces at mounting point where the bonding wire is attached. Power and Ground wires shall be in accordance with **NEMA WC 27500** or equivalent. Protect power wires with circuit breakers or fuses located close to the electrical power source bus.

3.4.3 Video Lines

Composite video connections shall be shielded coaxial cable in accordance with **M17/94-RG179** or equivalent. Cable shields shall be grounded at the source. Use of individual wires rather than proper coaxial cable connections through production breaks is unacceptable, and will cause significant and detrimental noise introduction to the video signal supplied to the AI-LCD68-01-xx.

3.5 Electrical Characteristics

3.5.1 Electrical Specifications, AI-LCD68-01-xx:

Electrical	Input Power	300 mA @+28 VDC
	Operating Voltage Range	+14 VDC to +32 VDC (Nominal +28 VDC)
	Screen Size	6.8" diagonal
	Aspect Ratio	4:3
	Resolution	1152 V x 234 H pixels (non-interfaced)
	Color Configuration	RGB Stripe
	Pixel Pitch	0.120(H) x 0.442(V) mm
	Colors	16 Million, 24 Bit
	Viewing Angle	> 120° H, > 90° V
	Brightness	250 NITS
	Contrast Ratio	150:1 typical
	Response Time	30 mS typical
	Backlight	Fluorescent Tube
	Video Format	NTSC
	Video Input	1 $V_{(p-p)}$, 75 Ω

3.5.2 Power protection via internal thermal fuses and thermal current limiting.

3.5.3 Video inputs cannot be paralleled to two (2) monitors. Call AI Systems Engineering Department for video installation assistance.

3.6 Physical Characteristics

3.6.1 Monitor utilizes plug-in shaft with key-way for “one-way alignment” and top mounted release button.

3.6.2 Arm assembly is black anodized 6061-T6 aluminum.

3.6.3 Monitor chassis material is 6061-T6 milled aluminum with a black powder coat finish.

3.6.4 This unit is designed for vertical mounting only.

3.6.5 Maintain an operating temperature between -15° to +55° C (+5° to +131° F)

3.7 Mating Connector Information

All wiring harnesses to the unit shall be supplied and fabricated by the installing agency.

Model #	Connector #	Mating Connector
AI-LCD68-01-02	J1	Cannon MS3120F12-10S installed in AI-BSE65-04-x
AI-LCD68-01-13	J1	Mounted in AI-BSE65-02-x Base, MDM-9PH003B

3.8 Pinout Assignment Descriptions

3.8.1 Pinout assignment for the AI-LCD68-01-02 base (AI-BSE65-04-x) is as follows:

J1	
Pin #	**Description**
A	POWER GROUND
B	RESERVED
C	+28VDC POWER INPUT
D	RESERVED
E	RESERVED
F	RESERVED
G	VIDEO -
H	VIDEO +
J	RESERVED
K	RESERVED

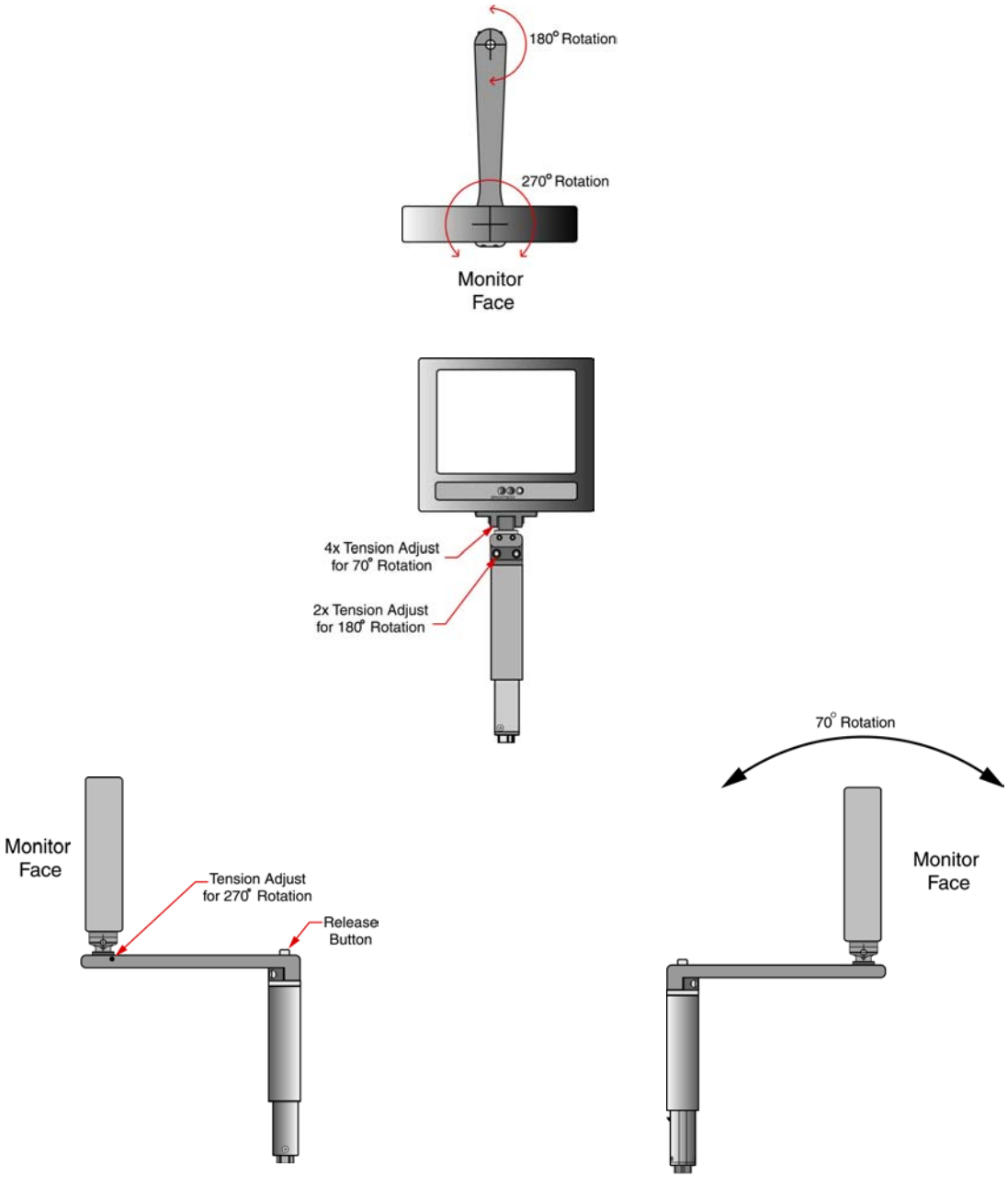
3.8.2 Pinout assignment for the AI-LCD68-01-13 base (AI-BSE65-02-x) is as follows:

J1	
Pin #	**Description**
1	GROUND
2	RESERVED
3	+28VDC POWER INPUT
4	RESERVED
5	RESERVED
6	RESERVED
7	VIDEO -
8	VIDEO +
9	RESERVED

4.0 Operation

4.1 Arm Mobility

The arm assembly possesses three (3) axis points of articulation as shown below. Note the tension adjust positions for the rotation axes as well as the Release Button used when tilting monitor forward or backward (70˚ rotation). The Release Button must be pressed to remove monitor from base. AI-LCD68-01-02 shown for reference purposes. "Monitor Face" labels indicate side with viewing screen.



5.0 Troubleshooting Guide

5.1 Post-Installation Test

5.1.1 Verify +28 VDC power has been connected to the unit.

5.1.2 Ensure that AI-LCD68-01-xx retains full range of motion (see Section 6.0, Reference Drawings, for motion limits).

5.1.3 Ensure video can be seen on monitor.

5.2 Cleaning Method

AI-LCD68-01-xx should be cleaned at least once every three (3) months or when excessive dust or dirt becomes apparent.

Use a twin pack cleaning system that employs a wet pad pre-moistened with an Isopropyl Alcohol based cleaner/anti-static solution and a lint-free drying cloth. Audio International, Inc. recommends using “Kleen & Dry” RR1205 manufactured by READ RIGHT, Nanuet, NY 10954.

- **Do not** use benzene, ammonia, thinner, or any other volatile substances to clean the monitor or screen. These chemicals may damage the screen or internal circuitry.

- **Do not** allow cleaner to puddle or pool around edges. Seepage may damage internal circuitry.

Audio International’s recommended cleaning method follows:

A. Turn off monitor.

B. Open pre-moistened pad and gently wipe evenly across display glass. Do not allow solution to “pool” or puddle around display edges.

C. Immediately dry display using the absorbent, lint-free cloth. Gently wipe display to a dry, clear finish.

5.3 General Troubleshooting Procedures

- Verify power to the unit by rechecking +28 VDC power is applied to the proper pins on the unit. Use a voltmeter to verify correct level.
- Remove power from the unit for at least one (1) minute and reapply power.
- Recheck all connections to the unit for security. Check all harness runs for possible pinching. Recheck all pinouts for application accuracy.

5.4 Instructions for Continued Airworthiness

No periodic scheduled maintenance or calibration is required for continued airworthiness of the AI-LCD68-01-xx, 6.8" Monitor Plug In. If the unit fails to perform to specifications, it must be removed and serviced by a qualified service facility.

5.5 Troubleshooting Chart

Problem	Possible Cause	Solution
Poor picture quality or scrambled video	➢ LCD backlight malfunction	• Contact AI
	➢ Poor video source	• Ensure source equipment and source material are functioning properly
Blank screen*	➢ LCD not receiving power	• Check all cable connections
	➢ Mother board malfunctioning	• Contact AI
Arm not retaining position when moved	➢ Repeated use has loosened tension adjust screws in arm assembly (see Section 7.0 for location of tension screws)	• Tighten screws until arm retains chosen position. Avoiding using excessive force as this may damage arm assembly

*The monitor displays a blue screen with the unit turned on and no video signal present.

6.0 Specifications

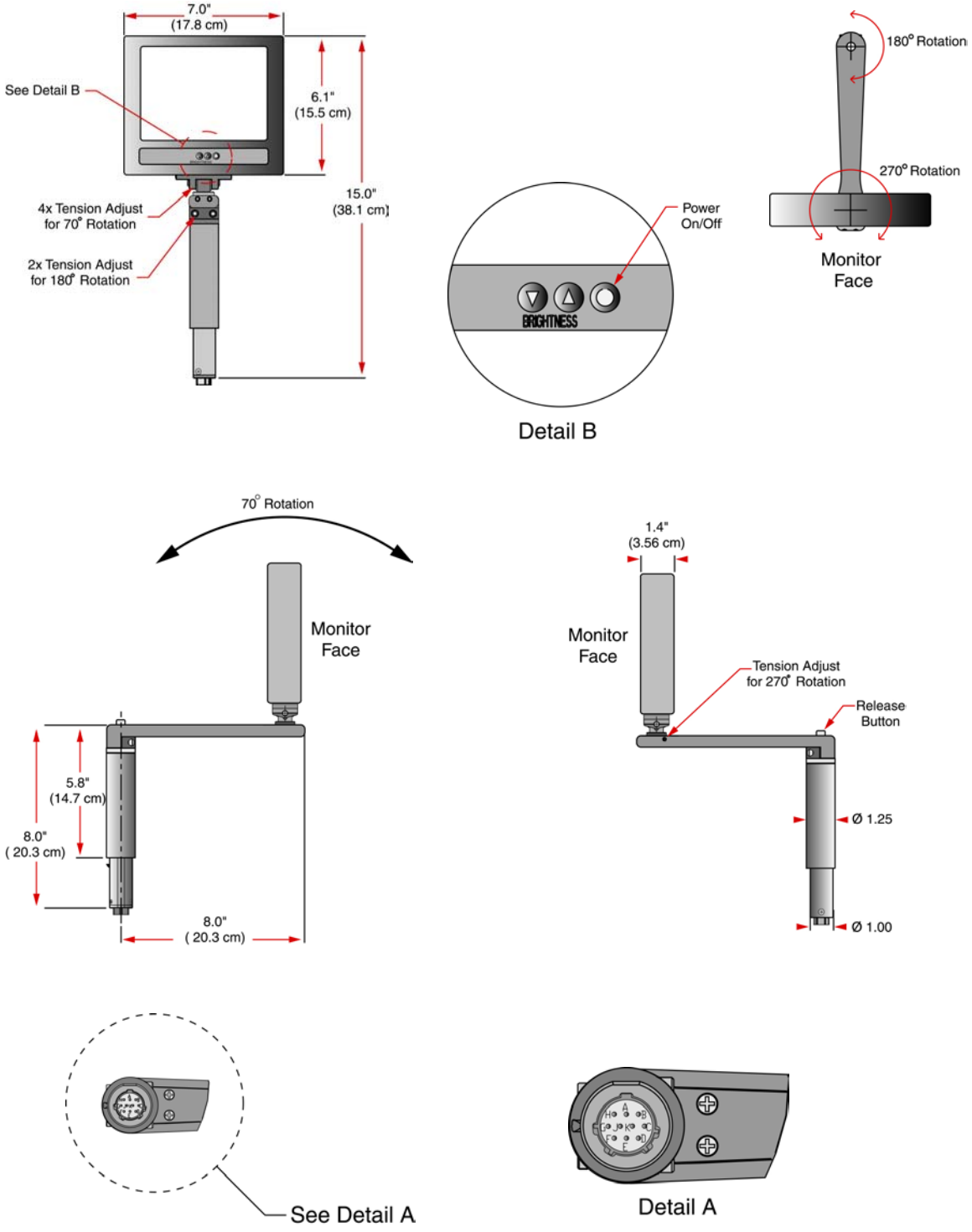
Unit Specifications for AI-LCD68-01-xx:

Physical Specifications – AI-LCD68-01-xx	
Screen Size	6.8" (56 cm) Diagonal
Monitor Dimensions (l x w x h)	7.0" x 1.4" x 6.1" 17.8 cm x 3.56 cm x 15.5 cm
Extended Arm Dimensions for (l x w x h)	See Section 7.0 for dimensions
Weight	Approx. 3.5 lb / 1.59 kg

7.0 Reference Drawings

7.1 AI-LCD68-01-02

The following diagrams show the unit dimensions and connector locations for the AI-LCD68-01-02. "Monitor Face" labels indicate side with viewing screen.



7.2 AI-LCD68-01-13

The following diagrams show the unit dimensions and connector locations for the AI-LCD68-01-13.